

AMENDMENTS TO THE CLAIMS

1 1. (Original) An apparatus for routing or switching data packets, including  
2 a router; and  
3 an expanded M-trie data structure, said data structure having a set of nodes, including a root  
4 node, inferior nodes and terminal nodes, wherein each node includes an address and  
5 an opcode.

1 2. (Currently Amended) An apparatus as in claim 1, wherein said data structure ~~includes a~~  
2 ~~means for performing~~ facilitates a lookup based on data included in a data packet.

AG 1 3. (Currently Amended) An apparatus as in claim 1, wherein said data structure ~~includes a~~  
2 ~~means for performing~~ facilitates a lookup of data included in a packet header.

1 4. (Currently Amended) An apparatus as in claim 1, wherein said data structure ~~includes a~~  
2 ~~means for performing~~ facilitates a lookup of data included in an Internet Protocol packet  
3 header.

1 5. (Currently Amended) An apparatus as in claim 1, wherein said opcode describes an  
2 operation to be performed based upon data included in a packet header so as to facilitate  
3 lookup of said packet header.

1 6. (Currently Amended) An apparatus as in claim 1, wherein said address includes the  
2 address of a ~~said~~ node in said expanded M-trie data structure that is to be traversed.

1 7. (Original) An apparatus as in claim 1, wherein said expanded M-trie data structure  
2 includes a set of access control parameters.

1 8. (~~Currently~~ Amended) An apparatus as in claim 1, wherein said expanded M-trie data  
2 structure includes a set of Quality of Service (QoS) parameters.

1 9. (~~Currently~~ Amended) An apparatus as in claim 1, wherein said expanded M-trie data  
2 structure includes a set of Class of Service (CoS) parameters.

1 10. (~~Currently~~ Amended) An apparatus as in claim 1, wherein said nodes include opcodes  
2 for demultiplexing, opcodes for matching, and opcodes for hashing and other specialized  
3 instructions.

1 11. (~~Currently~~ Amended) An apparatus as in claim 10, wherein said opcodes for  
2 demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3 ~~plus branches~~ data structure based on the contents of one or more bytes included in a data  
4 packet.

1 12. (~~Currently~~ Amended) An apparatus as in claim 10, wherein said opcodes for  
2 demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3 ~~plus branches~~ data structure based on the contents of one or more bytes included in a packet  
4 header that ~~that~~ is being read.

1 13. (~~Currently~~ Amended) An apparatus as in claim 10, wherein said opcodes for  
2 demultiplexing include instructions to demultiplex into branches of said expanded M-trie

3 ~~plus branches~~ data structure based on the contents of one or more bytes included in an  
4 Internet Protocol packet header that ~~that~~ is being read.

1 14. (Currently ~~Amended~~) An apparatus as in claim 10, wherein said opcodes for matching  
2 include instructions to compare the contents of a byte in the packet-flow label to given node  
3 data.

1 15. (Currently ~~Amended~~) An apparatus as in claim 10, wherein said opcodes for hashing  
2 include instructions to hash into different branches of the expanded M-trie ~~plus branches~~ data  
3 structure based on the contents of a byte in said packet header-122.

1 16. (Currently ~~Amended~~) A method for routing or switching data packets, including steps  
2 of receiving a data packet at an input interface on a router or switch;  
3 looking up information in the header of said data packet in an expanded M-trie data  
4 structure;  
5 terminating said lookup; and  
6 routing said data packet at one or more output interfaces on said router or said switch.

1 17. (Currently ~~Amended~~) A method as in claim 16, wherein said expanded M-trie data  
2 structure includes a root node, inferior nodes, and a terminal node, each node including an  
3 address and an opcode.

1 18. (Currently ~~Amended~~) A method as in claim 17, wherein said opcode describes an  
2 operation to be performed that is based upon data included in a packet header, so as to  
3 facilitate a lookup of said packet header.

1 19. (Currently Amended) A method as in claim 17, wherein said address includes the  
2 address of a said node in said expanded M-trie data structure that is to be traversed.

1 20. (Original) A method as in claim 16, wherein said expanded M-trie data structure  
2 includes a set of access control parameters.

1 21. (Currently Amended) A method as in claim 16, wherein said expanded M-trie data  
2 structure includes a set of Quality of Service (QoS) parameters.

1 22. (Currently Amended) A method as in claim 16, wherein said expanded M-trie data  
2 structure includes a set of Class of Service (CoS) parameters.

1 23. (Currently Amended) A method as in claim 17, wherein said nodes include opcodes for  
2 demultiplexing, opcodes for matching, and opcodes for hashing and other specialized  
3 instructions.

1 24. (Currently Amended) ~~An apparatus~~ method as in claim 23, wherein said opcodes for  
2 demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3 ~~plus branches~~ data structure based on the contents of a byte of said packet header that is  
4 being read.

1 25. (Currently Amended) A method as in claim 23, wherein said opcodes for matching  
2 include instructions to compare the contents of a given byte of the ~~packet-flow~~ label to given  
3 node data.

1 26. (Currently ~~Amended~~) A method as in claim 23, wherein said opcodes for hashing  
2 include instructions to hash into different M-trie plus branches based on the contents of a  
3 given 4 byte in said packet header-122.

1 27. (New) A bus carrying a data packet, the data packet comprising:  
2 an M-trie data structure having at least a set of nodes, including a root node, inferior nodes  
3 and terminal nodes, wherein each node includes an address and a code that indicates  
4 an action for a router to perform to select a leaf on the M-trie data structure.

1 28. (New) An apparatus for routing or switching data packets, comprising a device that  
2 performs a method comprising:  
3 receiving a data packet at an input interface on a router or switch, wherein the data packet  
4 includes information in an M-trie data structure having at least a header with at least  
5 an entity that indicates an action for the router to perform to select a leaf associated  
6 with the M-trie data structure;  
7 looking up the information, wherein the looking up includes performing the action; and  
8 routing said data packet at one or more output interfaces on said router or said switch.

1 29. (New) A method for routing or switching data packets, comprising:  
2 receiving a data packet at an input interface on a router or switch, wherein the data packet  
3 includes information in an M-trie data structure having at least a header with at least  
4 an entity that indicates an action for the router to perform to select a leaf associated  
5 with the M-trie data structure;  
6 looking up the information, wherein the looking up includes performing the action; and

7 routing said data packet at one or more output interfaces on said router or said switch.

1 30. (New) A memory storing a program for performing a method for routing or switching

2 data packets, comprising:

3 receiving a data packet at an input interface on a router or switch, wherein the data packet

4 includes information in an M-trie data structure having at least a header with at least

5 an entity that indicates an action for the router to perform to select a leaf associated

6 with the M-trie data structure;

7 looking up the information, wherein the looking up includes performing the action; and

8 routing said data packet at one or more output interfaces on said router or said switch.

1 31. (New) A memory as in claim 30, wherein said expanded M-trie data structure includes a

2 root node, inferior nodes, and a terminal node; wherein each node includes the entity and the

3 entity includes an address and an code; and wherein the code indicates the action.

1 32. (New) A memory as in claim 31, wherein said address includes an address of a node in

2 said M-trie data structure that is to be traversed.

1 33. (New) A memory as in claim 30, wherein said M-trie data structure includes a set of

2 access control parameters.

1 34. (New) A memory as in claim 30, wherein said M-trie data structure includes a set of

2 Quality of Service (QoS) parameters.

1 35. (New) A memory as in claim 30, wherein said expanded M-trie data structure includes a  
2 set of Class of Service (CoS) parameters.

1 36. (New) A memory as in claim 31 wherein at least one of the root node, inferior nodes, or  
2 the terminal node includes an opcode for demultiplexing, an opcode for matching, and an  
3 opcode for hashing.

1 37. (New) A memory as in claim 36 wherein said opcode for demultiplexing includes  
2 instructions to demultiplex into branches of the M-trie data structure based on contents of a  
3 byte of said packet header.

1 38. (New) A method as in claim 36, wherein said opcode for matching includes instructions  
2 to compare the contents of a given byte of a flow label to given node data.

1 39. (New) A method as in claim 36, wherein said opcode for hashing includes instructions  
2 to hash into different branches the M-trie data structure based on the contents of a given set  
3 of bytes in said packet header.

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